

CLAIMS

1. A frame adapted to support a plurality of heat exchangers one
in front of another in the direction of flow of cooling air on vehicle support members,
at least one of said heat exchangers being generally box shaped with projecting
components on opposite sides thereof, comprising:

two vertical walls interconnected at upper and lower ends by two transverse
walls;

cross braces between said walls;

fastening points on said walls adapted to fasten said heat exchangers to
said frame;

wherein said vertical walls include outwardly extending bulging sections,
said bulging sections each including

an outer portion adapted to be secured to said vehicle support
members to support said frame thereon, and

an inner portion defining a space between vertical wall sections
above and below said bulging section and adapted to receive
said projecting components of said at least one heat
exchanger.

2. The frame of claim 1, wherein said outer portions of said
bulging sections include downwardly facing surfaces adapted to be secured on top
of said vehicle support members.

-18-

3. The frame of claim 1, wherein said frame is adapted to support
a first of said heat exchangers on one side of said cross braces and to support a
second of said heat exchangers on the opposite side of said cross braces.

4. The frame of claim 1, wherein the cross braces are between
two of said heat exchangers, and include cross brace sections between said
vertical wall sections above and below said bulging section.

5. A heat exchanging element for a vehicle including a plurality of
heat exchangers, one in front of another in the direction of flow of cooling air,
comprising:

first and second heat exchangers;
connecting flanges on each of said heat exchangers, each of said
connecting flanges including an opening therethrough;
a supporting frame, including
two vertical walls interconnected at upper and lower ends by two
transverse walls,
cross braces between said walls,
supports securable to support members on said vehicle, and
at least one fastening opening on said walls for each of said heat
exchangers,
wherein each of said fastening openings is aligned with said flange
openings; and
connectors connecting each of said fastening openings to said aligned
flange openings, said connectors including a head and a stem with

-19-

18 an expandable end opposite said head retaining said connectors in
said aligned openings.

2 6. The heat exchanging element of claim 5, further comprising:
2 outwardly extending bulging sections in said vertical walls, said bulging
sections each including said supporting frame supports and defining
4 a space between vertical wall sections above and below said bulging
section; and
6 inlet and outlet connectors of said heat exchangers positioned in said space
defined by said bulging sections.

2 7. The heat exchanging element of claim 5, wherein the cross
2 braces are between two of said heat exchangers and include cross brace sections
between said vertical wall sections above and below said bulging section.

2 8. The heat exchanging element of claim 5, wherein said cross
2 braces comprise spaced flat members interconnected by flat bracing members,
said flat members and flat bracing members generally lying in planes parallel to the
4 direction of flow of cooling air through said heat exchangers.

2 9. The heat exchanging element of claim 8, wherein at least
2 some of said flat members and flat bracing members are oriented to direct air flow
toward the corners of said supporting frame.

-20-

10. The heat exchanging element of claim 5, further comprising
2 mounts on said frame cooperating with hooks on said heat exchangers to support
said heat exchangers on said frame.

11. The heat exchanging element of claim 10, wherein:
2 said mounts and cooperating hooks support said heat exchangers on said
frame in one direction; and
4 said connectors support said heat exchangers on said frame in a second
direction;
6 wherein said first and second directions are not parallel to one another.

12. The heat exchanging element of claim 11, wherein said
2 mounts and cooperating hooks supporting one of said heat exchangers permit
thermal expansion in a direction transverse to the stem of the connector connecting
4 the flange opening of said one heat exchanger to said frame.

13. A frame adapted to support a plurality of heat exchangers one
2 in front of another in the direction of flow of cooling air, said cooling air flowing from
a front side of said frame to a back side across heat exchange surfaces of said
4 heat exchangers supported between said frame sides, comprising:

two vertical walls interconnected at upper and lower ends by two transverse
6 walls, said walls extending between said front and back sides;
cross braces between said walls;
8 fastening points on said walls adapted to fasten said heat exchangers to
said frame;

10 supports securable to support members on a vehicle; and

-21-

12 a fan shroud securable to one of said fastening points at said back side of
 said frame by at least one releasable connector.

2 14. The heat exchanging element of claim 13, further comprising
 mounts on said frame cooperating with hooks on said fan shroud to support said
 fan shroud on said frame.

2 15. The heat exchanging element of claim 14, wherein said
 mounts, cooperating hooks and at least one releasable connector support said fan
 shroud on said frame in said direction of cooling air flow, and further comprising a
4 fan shroud outer edge overlapping said walls to support said fan shroud on said
 walls transverse to said direction of cooling air flow.